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Misguided Praise for Reagan's R&D Budget

The hallelujahs that science-policy circles are emitting over the Administration's new-found willingness to throw a few more bucks into basic research are not wholly unjustified, given the benighted tendencies that the Reaganites revealed in their first two years of power.

But lest the delusion spread that Mr. Reagan is presiding over a fiscal renaissance of American science, it would be useful to note that, by and large, he is merely undoing some of the damage that he inflicted earlier. And his principal means for accomplishing this is through the ravaging of many worthy research and development programs that fail to fit his ideologists' dubious division of public and private responsibilities.

Some perspective on these matters may be obtained by examining the Administration's Jekyll and Hyde treatment of the National Science Foundation. While it

Q&A with Rep. George Brown On Agricultural R&D — page 4

is certainly true that the President's budget for fiscal 1984 calls for a major boost for NSF—from the current $1 billion to $1.137 billion—the budget that Jimmy Carter left behind when he went out of office called for giving NSF even more than that two years ago. The sum Carter specified was $1.157 billion. Instead, the Reagan budgeteers cut the guts out of that 1982 spending plan and NSF ended up with about $40 million less than it had in fiscal 1981. It is fair to say that if today's Reaganite saviors of basic research had retained the pace of growth that prevailed at NSF over the preceding years, the Foundation would now be around the $1.5-billion mark.

The Administration's performance on federal funds for pre college science and math education bears that same pattern of assault and battery followed by offers of assistance. NSF's programs in those fields were an early victim of the Office of Management and Budget. In May 1982, when the National Academy of Sciences convened educators from around the country for a national convocation on science education (SGR Vol. XII, No. 10), the Administration sent a barely civil message that, in part, stated, "Somehow, in recent years, many Americans have lost some of the conviction that knowledge and hard work are the keys to success."

However, when grass-roots concern about the decay of science and math education became evident, and Congress put back some of that NSF education money, the Administration underwent a conversion. The 1984 budget provides funds for both NSF and the Department of Education to support science and math education programs, but with budgets that won't provide for more than token efforts—$25 million for NSF, $50 million for the notoriously incompetent and heavily politicized Department of Education. Little wonder, then, that a bill, the Emergency Mathematics and Science Education Act, providing $425 million for science education in fiscal 1984, was passed by the House, 348-54, on March 3 (see page 7).

In regard to that bill, it is instructive to note that the Administration, despite its vocal enthusiasm for

(Continued on page 2)

In Brief

With federal budgets for R&D booming and high-tech touted as the savior of the economy, Congressmen are showing new interest in science-related committees that were once shunned as legislative sideshows. The House Science and Technology Committee has become a popular assignment. Its Subcommittee with the widest jurisdiction—Science, Research, and Technology—has been expanded, in response to members' requests, from last year's 15 slots to 20 in the current session.

Senator Robert Dole (R-Kan.) has introduced an animal-welfare bill, the Improved Standards for Laboratory Animals Act (S 657), that would establish uniform standards based on NIH's present guidelines and give the US Department of Agriculture stronger enforcement authority. Passage of any animal-care bill is still some way off, but favorable committee action in the House last year suggests that Congress is inclined to accept the need for tightening up the present system (SGR Vol. XIII, No. 2).

Never hesitant to gripe aloud and lobby hard for funds for the Stanford Linear Accelerator Center, Director W.K.H. Panofsky is also willing to acknowledge a bountiful budget. Writing in SLAC's staff newslatter, Panofsky notes that the Administration has recommended $40 million for a linear collider at the facility—"very close to the amount which we had requested." If Congress approves the request, he continues, progress "will be limited mainly by our ability to perform, rather than by external financial limitation. In other words," Panofsky told his staff, "to quote Pogo, 'We have seen the enemy and he is us.' "

...Civilian R&D Has Actually Taken a Beating

(Continued from page 1)

science, technology, and their educational underpinnings, opposed the bill with vintage Reaganism. Speaking for the Administration, Rep. John N. Erlenborn (D-Ill.) declared that "it is the height of irresponsibility...to create a new $400-million-a-year-spending program in the face of a $200-billion deficit....It is obvious," he continued, "that the [Education and Labor] committee has no fear that we might just be throwing money at a problem with the hope that it would simply disappear....Given the scope of this legislation," Erlenborn went on, "I fear that Congress will be raising expectations and making promises that are not likely to be fulfilled and without any certainy that whatever amount is sought will produce the result desired."

What's especially bizarre about the plaudits that have been lavished on the Administration for its treatment of NSF and other civilian agencies is that never before has civilian R&D spending taken such a beating. Hewing to the fantastical principle that applied research is none of the government's business since if it's economically worthy—so goes the theory—the private sector will foot the bill, the Reagan Administration has actually reduced federal spending for civilian R&D by $3 billion below the Carter figure. Meanwhile, it has raised defense R&D by $14 billion.

It might be expected that this unwholesome imbalance would be publicly noted, if not deplored, by the leading mandarins of the scientific community. But the care and feeding of basic research is their all-consuming interest, and if that's being attended to, all is well, in their tunnel-visioned view of the matter. Thus, in a statement presented February 23 to the House Science and Technology Committee, Frank Press, President of the National Academy of Sciences, observed that "Funding remains a recurring refrain. And funding here means real growth."

Then, without any reference to the fact that the Reagan budget adds up to "real growth" only if one indulges in arithmetical acrobatics, Press went on to say that "I am pleased with the Administration's treatment of basic research in the FY 1984 budget. The increases for the Ntional Science Foundation were desperately needed...I think all those involved in this decision—especially Drs. Keyworth and Knapp [presidential Science Adviser and NSF Director, respectively] are to be commended for their foresight and appreciation of the essentiality of science to the nation's future."

The reality, of course, is that Keyworth and Knapp are presiding over the repair of damage inflicted by the Administration's ideologues over the past two years.

With good luck, and continuing pressure from the public and especially the Democratic majority in the House, the Reagan Administration may just possibly pull off the remarkable feat of going into the history books as a stout friend of research and science education.—DSG

Pell Named to OTA Board

Senator Claiborne Pell (D-RI) has been appointed to the Board of the Congressional Office of Technology Assessment, succeeding Senator Howard Cannon (D-Nev.), who was defeated last November. The Board consists of six members from each house, and is evenly divided by party. Other members are:

Republican Senators Ted Stevens (Alaska), Orrin G. Hatch (Utah), and Charles McC. Mathias (Maryland); Democrats Edward M. Kennedy (Mass.) and Ernest F. Hollings (SC).

Republican Representatives Larry Winn Jr. (Kansas), Clarence E. Miller (Ohio), and Cooper Evans (Iowa); Democrats Morris K. Udall (Arizona), George E. Brown Jr. (Calif.), and John D. Dingell (Michigan). Udall is Chairman and Hatch is Vice Chairman.

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Canadian Ire and the Acid Rain Doublecross

You don't need a degree in atmospheric chemistry or international law to understand why Canadians feel outraged by the Reagan Administration's evasive dealings on the acid rains eating away at their forests and waterways.

We've double-crossed them, plain and simple, by weaseling on a clearly worded understanding to work cooperatively on a problem that threatens Canada's biggest industry, forest products. To be noted, too, is that acid rain is an increasingly serious threat to our own territory, particularly in the northeast.

The outrage that the Canadians feel was all the more intensified recently by the Justice Department's decision to apply a propaganda label to two Canadian films on acid rain. But the petty application of that rarely used labeling authority is nothing compared to the runaround that the Canadians have received from Washington over the past two years in their efforts to carry out that acid-rain understanding.

It was in August 1980 that the two countries, in the spirit of cooperation that had traditionally characterized their intergovernmental dealings, signed a Memorandum of Intent on acid rain. The document stated that "environmental stress could be increased if action is not taken to reduce transboundary air pollution." And it stated that the two countries agree to "promote vigorous enforcement of existing laws and regulations" governing air pollution while intensifying research on the scientific complexities of acidification.

No one claims that the meteorology and biochemistry of acid rain are fully understood. But an accumulation of evidence from around the world points to emissions of sulfur dioxide from industrial smokestacks as the fundamental source of the airborne acid that has killed fish and forests in Canada, the US, and northern Europe. In Ontario alone, acid-based fish kills have been identified in some 4000 lakes. With American industry—particularly coal-burning powerplants in the midwest—estimated to be the source of some two-thirds of acidic pollutants falling on Canada, bi-lateral cooperation was indispensable.

Coming into office with an openly declared contempt for environmental purity, the Reagan Administration concluded that the Memorandum of Intent carried only moral, rather than legal, force. And, without consulting the Canadian government, it promptly went its own way. During its first year, the Administration permitted 13 states to increase their sulfur-dioxide emissions and backed off from sanctions against many plants that had been found in violation of the Clean Air Act.

Taking the position that pollution abatement should await further scientific investigation, the Administration went along with the Memorandum's provisions for scientific reviews of acid rain problems and abatement techniques by joint American-Canadian working groups. But Washington signaled its intent to keep a short leash on the scientific studies. The National Academy of Sciences was eased out of its longstanding role of reviewing the quality and integrity of many major government-supported pollution studies. The task was assigned to a committee attached to the White House science office.

In contrast, the Canadians, stressing that the scientific assessments should be shielded from politics, assigned the review authority to their national counterpart of our Academy, the Royal Society of Canada.

Shortly after he took office, Secretary of State George Shultz made a conciliatory move aimed at setting out the areas of disagreement. The result, just in, is a paper by a US group stressing the scientific uncertainties, and a paper by a Canadian group insisting that regardless of some gaps in the scientific picture, cost-effective abatement moves could be started now to achieve major emission reductions by 1990. With ample evidence to back them, the Canadians argue that acid-rain damage appears to be enduring if not irreversible; therefore, they suggest, it would be prudent to aim for prevention before all the decimal points are in on what

(Continued on page 4)

A Surprise for White House?

A bit of a political surprise may be produced by the scientific panel that the Reagan Administration set up last year to review papers by three Canadian-American working groups on acid rain. Attached to the White House Office of Science and Technology Policy (OSTP), the panel, chaired by William A. Nierenberg, Director of the Scripps Institution of Oceanography, is due to present its final report near the end of April.

According to a source close to the panel, the report will go beyond a mere evaluation of the bi-national papers and strongly recommend that the US undertake serious steps to reduce sulfur dioxide emissions. "We'll be telling them," SGR's source said, "that the sulfur deposition can't be good and that we ought to be doing something about it."

The recommendation has been cleared with OSTP Director George A. Keyworth, we're told.

The basic thrust of the panel's report, the source emphasized, is "to tell the White House that you can't ignore this problem."

Rep. Brown Planning Long Look at Ag Research

One of the best-informed and most persistent Congressional overseers of federal research affairs is Rep. George E. Brown Jr. (D-Calif.), a longtime member of the Science and Technology Committee and Chairman of the Agriculture Committee's Subcommittee on Department Operations, Research, and Foreign Agriculture. A member of the House since 1963—with one term out following an unsuccessful run for the Senate in 1970—Brown has become especially influential in agricultural-research policy, a subject on which his Subcommittee is planning an extensive inquiry. Brown discussed the coming hearings and other research-related matters with SGR on February 25. Following is a transcript of that conversation, edited for brevity and clarity:

●

SGR. You're skeptical of our agricultural-research system. Why?

Brown. Some of the areas that everyone recognizes as being breakthrough areas are not being adequately handled. The best example is in the field of cell biology and genetic engineering. That research is not noted for coming out of the agricultural-research system. And yet, within the last few weeks we've had breakthroughs indicating the possible genetic transfer from bacteria to plants may hold the secret of the fixing of atmospheric nitrogen; it may revolutionize the whole question of how we provide nitrogen fertilizer to new classes of crops. There are potential breakthroughs in animal biology. Plant biology seems to be an area of very great promise which is not being adequately investigated. There aren't enough competent people in the field. Then there are a separate set of problems having to do with whether the system is really focusing on the long-term sustainability of the resource base, and projecting the kinds of problems that will confront us if we are not able to sustain the base. These are big problems, but they are problems that either are emerging out of research in other fields, or they require a long-range look which is not necessarily being taken.

Living with Old Goals

SGR. Why hasn't the Agricultural Research Service been attending to these problems?

Brown. What you have in the ARS is a big, well-funded and highly stable system in which your leading people in the field are very senior people who got their training and set their own research goals and other goals in a prior generation—25 years ago.

SGR. Is the leadership obsolete?

Brown. I would say there is a failure to reinvigorate the research force. There are not enough bright, young scientists coming into the system to transform it. And it takes one hell of a long time to transform it. I'm not saying it's incapable of transformation. I am saying that institutional inertia, which is typical in any institution, may not allow it to keep up with the pace of change which is taking place today.

Opportunities for Change

SGR. What's the schedule for your Subcommittee's look into these problems?

Brown. We are committed to a thorough—probably one to two year—examination of this problem, beginning as soon as we get the mandatory work of this session out of the way. Probably in three or four months we will embark upon a thorough review of the Agricultural Research Service. We have made efforts at correcting some of these problems through modest innovations such as the competitive grants system, which we put into the legislation several years ago, but which has not achieved its goal or its potential because of resistance here in the Congess. And that resistance comes from a Congressional base of support for the old institutional system. Fundamentally, the attitude is that it's been a good system, it's worked for a hundred years, and let's not go tinkering with it by some of these bright, new ideas which are not proven. Well, no bright, new idea is ever proven when it starts. So, we will work on both the problems of producing a climate for change in the Congress and an analysis of the kinds of changes that need to be made in the institutional system. We'll make some modest changes, I think. I'm not optimistic that we're liable to come up with any radical shifts in an institutional system this large. But I think it's ripe for some transformation of significance.

SGR. The ARS has just announced a six-year strategy that it says is responsive to the major outside criticisms of recent years (SGR Vol. XIII, No. 4).

Brown. I haven't gone over that yet. But we'll be looking at that as well as other new developments.

(Continued on page 5)

ACID RAIN *(Continued from page 3)*

already appears to be a solid scientific case. The two papers set out the issues, but say nothing that hasn't been said many times before.

With the Reagan Administration in retreat on environmental issues because of the scandals at the Environmental Protection Agency, it may be inclined to rethink its shabby performance on acid rain.

It is ironic to recall that the Administration's quiet repudiation of the Memorandum of Intent began when America was saying, "Thank you, Canada," for the brave assistance it rendered our diplomats in the Iranian hostage crisis.—DSG

...Implementing the "Winrock" Report

(Continued from page 4)

SGR. The so-called Winrock report [produced by a panel co-sponsored by the White House science office last year—SGR Vol. XII, No. 14] raised the possibility of consolidating some of the big ARS centers, perhaps closing out some that may be out of date. Do you think there's any political reality to that?

Brown. It's in the same category of political reality as closing down military bases. It does not happen often. It requires a particular confluence of events, which may be budgetary, or a shift in the political winds, or a major shift in the 'actors' in the Congress. I don't think it's inconceivable that we can begin that process. I would agree with the thrust of the Winrock report that we have had a proliferation of research facilities. I think the thrust of the Winrock report would be that if these facilities have some local or regional value, then the local or regional financing sources should undertake the responsibility of keeping them for whatever value they have. They're not necessarily a part of a national research program. I think we could easily use that argument to begin a process of shedding some of them.

SGR. How extensive will your hearings be?

Brown. To some extent, that depends on the resources we have. The Agriculture Committee is not well-funded with regard to staff. Historically, it has not felt it need be all that activist in carrying out examinations of these programs. I'm trying to develop a few more resources. We've borowed staff in the past. We've used loaned staff from state agencies, we've used the Library of Congress and we've gotten help from the General Accounting Office. We've commissioned some reports from the Office of Technology Assessment. We need to continue with that, but also get a little stronger cadre of permanent staff to direct those activities.

Pressure on Agencies

SGR. Some of the research administrators in agriculture now concede that they paid insufficient attention to these criticisms in the past. But they said they've turned the corner and that proper attention is now being paid. Do you accept that?

Brown. Partially. The situation is not exactly homogeneous. There are some institutions, some states that have outstanding programs, that have adapted. There are others which, for one reason or another, have been slower to recognize that the times are changing. We will need to examine those situations and avoid making blanket criticisms.

SGR. What's the potential for legislatively induced change? How much influence can you have over the system through legislation from your Subcommittee?

Brown. It's an interactive process. The agencies and institutions are not stupid. If they perceive a continuing pressure coming from the Congress, whether it's reflected in legislation or just a closer oversight role, they tend to adapt themselves to the way they see these pressures are moving. They will make internal changes more rapidly if they see the necessity to do so. That's part of the game here—to keep the pressure on over a sufficiently long period of time. Whether or not it's reflected in legislation depends on the particular circumstances. The message from every administration is that we don't need new legislation for carrying out most of these programs. If it's useful, we can do it within the existing framework, they say. To some degree that's true. On the other hand, you look at the legislative framework and you see that a lot of it in agriculture is obsolete, and does not reflect guidance of the kind that should be given to the agency in these particular times.

Stubborn Attitudes

SGR. What, for example, is obsolete?

Brown. In Extension, the first thing that we observe is that the pattern of the distribution of funds is obsolete. We see the same thing in Ag research, too. It's based upon formulas which were built up over the last 50 to 100 years to reflect political and other balances that existed at a particular time, and those are no longer true. Whatever the underlying rationale was in terms of overall national needs no longer exists. The demographic shifts and the shifts in the patterns of agriculture would indicate that. So would the rural-urban shifts. So, we have to examine that and see if we can come up with some rationale that better represents the national interest.

SGR. You've been out front on this issue. Do you find your colleagues coming along now?

Brown. About what you would expect. I think there is an awareness of the need to make changes. There's also the customary, usual, and natural desire to protect that which benefits the state, the region, the district, and the individual. You don't overturn those attitudes easily. You have to show there's an overriding national basis, and then you have to generate a political power that is commensurate with that. There's always the possibility of some modest change. And the way you operate here is to get as much as you can and keep plugging for what you didn't get.

SGR. Why has the competitive grants program been held to a low budget?

Brown. That's due to the personalities of the decision makers here in the Congress. Since all of them are good friends and old acquaintances of mine, I don't want to criticize it too much. But it's obvious that when the

(Continued on page 6)

...Scientists Becoming More Active Politically

(Continued from page 5)

Chairman of the Ag Appropriations Subcommittee [Rep. Jamie L. Whitten] has been from Mississippi for the last 30 or 40 years, you're not going to do anything that's going to adversely impact Mississippi, the region, or other concerns of that particular Chairman. But there's nothing malign about that; that's a very natural pattern.

SGR. Why is there serious hostility to the idea of competitive grants? The money doesn't come out of the formula programs.

Brown. It wasn't intended to take funds from formula programs. It was intended to be an add-on. But there's an attitude that runs through Congress, that the system for the distribution of scientific-research funds tends to be an elitist system, going to a very small number of prestigious institutions. While there's great value in doing that, it neglects what a large number of Congressmen feel is the potential that exists for development in their own regions. Rightly or wrongly, you can't find anybody from Arizona, Idaho, or Vermont who doesn't feel they've got the seeds for great potential in those regions and they need fair treatment.

Election Support

SGR. Do you find that scientists are becoming more politically active to look after their professional intersts?

Brown. There's a growing awareness that's reflected in most of the professional societies in the scientific and engineering fields that they need to be more closely inter-connected with the policy structure. And most of them now devote special efforts—they have a special section or something of that sort—to be concerned with science-policy matters. They're getting involved. You not only have to provide an information flow in these areas, you have to recognize there's an action component.

SGR. In this last tough election that you had [Brown received 54 percent of the vote], did the scientific community reciprocate the interest that you've shown it over the years?

Brown. Yes. We had greater financial contributions, greater involvement in the campaign than at any time in my experience. I find within my own district and region that there are more people now identifying those members of Congress whose attitudes are supportive of the scientific community.

SGR. You've expressed concern about the heavy tilt toward defense research in the Administration's '84 budget.

Brown. The research and development component has sort of marched in step with the general increase in the defense budget. Now, that's not making the contribution to the overall needs in R&D that the dollars would really indicate, because so much that is budgeted as R&D is weapons-system development, the big-ticket items. They don't really contribute to the pool of knowledge. I don't think the knowledge-transfer process in the defense establishment is as good as I would like to see it, for the obvious reason that they feel that if it's valuable for defense, it shouldn't be disseminated in a way that will allow potential enemies to get it. That attitude extends even to those areas where the applications are largely of a civilian nature. And there's also a philosophy there that they don't want to benefit either the civilian economic or the military development of an unfriendly country. They perceive this as total war, and we therefore don't want to do anything to be helpful.

In Print

Large Scale Computing in Science and Engineering, report of a panel sponsored by Defense, NSF, in cooperation with NASA and the Department of Energy, concludes that there aren't enough supercomputers for those who could effectively use them in academe and government and that efforts to develop still bigger machines are inadequate and "will yield only a small fraction of the capability and capacity thought to be technically capable in this decade." (42 pages, available without charge from E.F. Infante, Room 339 National Science Foundation, 1800 G St. Nw, Washington, DC 20550.

Science and Engineering Personnel: A National Overview, (NSF 82-318), second of a biennial NSF series, presents extensive data on educational enrollments, degrees awarded, employment, etc.; reports that women in the science and engineering work force increased from 9 to 13 percent of the total between 1976 and 1980; blacks have gained, too, but still accounted for only 2 percent of employment. ($5 per copy; order from Superintendent of Documents, USGPO, Washington, DC 20402; request stock number 038-000-00-518-9).

Climbing the Ladder II: An Update on the Status of Doctoral Women Scientists and Engineers, latest report of the National Academy of Sciences' Committee on the Education and Employment of Women in Science and Engineering. Among major findings: percentage of women among new PhD recipients in science and engineering rose from 18 to 23 percent between 1977 and 1981; appointment of women to assistant professorships slightly exceeded their proportion among recent PhD recipients, but they continued to hold a disproportionate share of non-tenure track appointments. ($8.95 per copy; order from National Academy Press, 2101 Constitution Ave. Nw., Washington, DC 20418.)

"Emergency" Education Bill Wins by Big Vote

It's little more than a small down payment on the sums that the specialists say are needed for rehabilitating science and math education. But, from small beginnings great enterprises can grow. And, in the context of the Reagan Administration's accelerating turnabout on federal responsibility in this area, the House passage March 3 of the Emergency Science and Mathematics Education Act is an important event.

The legislation, which is now in committee hearings in the Senate, authorizes $250 million in Fiscal 1984 for locally operated in-service training programs, curriculum development, and purchases of instructional materials and equipment at the precollege level. Funds will initially be allocated to the states on a formula basis, but at least 75 percent of each state's funds must be transferred to local authorities.

At the postsecondary level, the legislation provides for programs in mathematics, science, and foreign languages, with $20 million authorized in 1984 for up to 5000 scholarships for prospective teachers; the number rises to 10,000 in 1985. In addition, the bill provides $5 million a year from 1984 through 1988 for pedagogical research on math, science, and foreign languages; the same sums for the Minority Institutions Science Improvement Program, as well as funds for summer institutes for teachers.

The legislation authorizes $100 million in matching grants—to be administered by the National Science Foundation—for postsecondary fellowships and research equipment.

Quotes: Industry and Academe

The following excerpt is from testimony March 2 before a House Science and Technology subcommittee by Robert M. Rosenzweig, President of the Association of American Universities:

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We are hearing much these days about the potential to meet the nation's needs for research and highly trained people by forging closer ties between universities and industry. There are important opportunities, it is true, to strengthen those ties in ways that will result in greater investments by industry in university research and education programs. After looking at the current scene with some care, however, I can only conclude that the long-range potential here is probably considerably less than many would hope for.

While much attention is being given to a relatively small number of potentially significant and highly publicized cooperative arrangements, it is good to remember that there is little here that is genuinely new. What is new is the intense interest focused on a few especially promising areas, particularly in the life sciences. For many other fields, little has changed. For most, sustained national investment in basic science, funded through the agencies of our federal government, must continue to be the primary, even sole, source of research support.

NSF Confirmation Hearing Set

The Senate Labor and Human Resources Committee has scheduled a confirmation hearing on April 12 for Edward A. Knapp, who has held an interim appointment as Director of the National Science Foundation since last November (SGR Vol. XII, No. 21).

Basking in the glow of a big budget boost for NSF in the Administration's fiscal 1984 budget, Knapp is expected to sail through without difficulty. If the hearing had taken place shortly after his appointment, he would very likely have faced hostile questioning about his dismissal of three senior NSF administrators shortly after he took over. But, as things go in Washington, that was long ago.

The long delay in scheduling a confirmation hearing arises solely from the crowded Congressional calendar—post-election lame duck last year and the customary jam-up of a new session this year. But the delay is considered beneficial in Administration science-policy circles, since it has allowed a cooling of sentiments over those firings.

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US Science Attaches Abroad: Who's Where

For running down information about research activities in other countries, it's often possible to obtain assistance from the network of science officials assigned to over a score of American embassies and other posts around the world. Their responsiveness varies according to available time, industriousness, and the reasonableness of requests. But, in many circumstances, they're able and willing to help out—though many are not keen for this word to get around. In any case, since many readers have found it useful, SGR from time to time publishes the State Department's current list of these researcher-diplomats. Unless otherwise specified, the title is Science Attache and the address is American Embassy:

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Europe

Belgrade, Yugoslavia: Sidney Smith; tel. 645-655

Bonn, West Germany: Robert G. Morris, Science Counselor; APO New York 09080; tel. (0228) 339-3390

US Mission, European Community, Brussels, Belgium: John Fry; tel. (02) 513-3830

US Mission, Geneva, Switzerland: Gordon Cartwright, Science Liaison Officer; tel. (031) 437-011

London, England: Justin Bloom, Science Counselor; Box 40, FPO New York 09510; tel. (01) 499-9000

Madrid, Spain, Francis Kinnelly; APO New York, 09285; tel. 276-3400/3600

Moscow, USSR: John M. Joyce, Science Counselor; APO New York 09862; tel. 252-24-51 through 59

Paris, France: John Boright, Science Counselor; APO New York 09777; tel. 296-1202, 261-8075

US Mission, OECD: Thomas Wajda, Science Counselor, 19 Rue de Franqueville 75016, Paris; tel. 524-8200

US Mission, UNESCO; John Granger, 1 Rue Miollis 75015, Paris; tel. 577-1610

Rome, Italy: Lawrence Finch, Science Counselor; APO New York 09794; tel. (06) 4674

Stockholm, Sweden: Robert Goeckermann; tel. (08) 63.05.20

US Mission, International Atomic Energy Authority: Peter Brush, 21-25 Kundmanngasse, Vienna, Austria; tel. (222) 31-55-11

Warsaw, Poland—vacant

●

Latin America

Buenos Aires, Argentina: Gerald Whitman, Science Counselor; APO Miami 34034; tel. 774-7611/8811/9911

Mexico City, Mexico: Clifton Metzner, Science Counselor; tel. (905) 553-3333

Brasilia, Brazil: Daniel Serwer; APO Miami 34030; tel. (061) 223-0120

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East Asia and Pacific

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Tokyo, Japan: Gerard Helfrich, Science Counselor; APO San Francisco 96503; tel. 583-7141

Seoul, Korea: Robert Liimatainen; APO San Francisco 96301; tel. 72-2601 thru 19

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Near East and South Asia

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New Delhi, India: Robert Stella; tel. 690-351

Tel Aviv, Israel: Dennis Jett; APO New York 09672; tel. 654-338

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